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August 24, 2000

Atty. Docket No.: P65868US0
CUSTOMER NUMBER: 00136

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of **Nobuyuki MATSUKAWA** for **IMAGE PICKUP APPARATUS AND METHOD OF CONTROLLING THE SAME.** The application comprises a **15**-page specification including **5** claims (3 independent) and Abstract, **5** sheets of drawings, and a Declaration and Power of Attorney.

Accompanying this application for filing is:

Assignment document, cover sheet and **$40.00** fee for recordation of Assignment; and

A certified copy of **Japan** Application No. **1999-236627**, filed **24 August 1999**, the priority of which is claimed under 35 U.S.C. §119.

The filing fee has been calculated as shown:

Large Entity		$690.00
Total Claims	5 in excess of 20 = 0 (x $18.00)=	.00
Total Ind. Claims	3 in excess of 3 = 0 (x $78.00)=	.00
	TOTAL FILING FEES	**$690.00**

Check No. 49268, in the amount of $730.00, is enclosed to cover the Filing Fee and Assignment recordation fee. The Commissioner is hereby authorized to charge payment of any fees set forth in §§1.16 or 1.17 during the pendency of this application, or credit any overpayment, to Deposit Account No. 06-1358. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

JACOBSON, PRICE, HOLMAN & STERN, PLLC

By _____
John C. Holman
Reg. No. 22,769

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IMAGE PICKUP APPARATUS AND METHOD OF CONTROLLING THE SAME

BACKGROUND OF THE INVENTION

The present invention relates to an image pickup apparatus. Particularly, this invention relates to an image pickup apparatus, such as, a video camera equipped with a charge-coupled device (CCD).

A charge-coupled device used for video cameras has a light-receiving section 100 and a light-blocking section 101, arranged as shown in FIG. 1A.

The light-receiving section 100 receives light from an object via lens to generate an analog video signal which is converted into a digital video signal by analog-to-digital conversion.

On the other hand, the light-blocking section 101 blocks the light by an aluminum plate, for example. The light-blocking section 101 is also provided with a horizontal black-reference detector to detect horizontal optical-black (OB) data.

The OB data is a black-reference (optical black) signal for indicating reference of optical black used for displaying pictures. The black-reference signal is used to clamp the reference level of the digital video signal for achieving a high reference-level stability.

The OB data is supplied to a digital processor installed in a video camera. The digital processor accumulates the OB data in the horizontal direction and calculates the average value of the accumulated OB data for each predetermined number of pixels in the horizontal direction. The digital processor further accumulates the average values in the vertical direction and calculates the average value of the accumulated average values for each predetermined number of pixels in the vertical direction. The average value obtained in the vertical direction is output as the final OB data.

The number of scanning lines for accumulation in the vertical direction is 128 lines for television signals according to the NTSC (National Television System Committee) system.

In detail, as illustrated in FIG. 1B, the OB data are

accumulated for each group of Nh pixels (Nh = 16, for example) after N pixels from the rising edge of a horizontal synchronizing signal (HD) for calculation of the average value of the OB data in the horizontal direction.

The calculation of average value in the horizontal direction starts at the Y-th line after the rising edge of a vertical synchronizing signal (VD), and the calculation of average value in the vertical direction starts at the Nv-th line (Nv = 128, for example) after the Y-th line.

Performance specifications of a driver to drive the CCD decides at which clock after the rising edge of the HD the OB data calculation starts in the horizontal direction and after how many HDs from the VD the OB data calculation starts in the vertical direction.

The number of times for accumulation in the horizontal direction is preferably smaller than the number of pixels located in the light-blocking section 101 and the accumulation is preferably applied to pixels the number of which is 2^n (n: a positive integer). Moreover, the accumulation in the horizontal direction preferably starts at the m-th line (m: a positive integer) so that the accumulation can be applied to the center pixels from which the OB data can be detected on the light-blocking section 101.

The accumulation in the vertical direction is, for example, applied to 128 lines as discussed. The number "128" is the maximum number of lines because the value that comes next to 128 ($= 2^7$) is 256($= 2^8$) that is larger than the number of scanning lines for TV signals according to the NTSC system. Moreover, the accumulation in the vertical direction preferably starts after several lines from the rising edge of the VD so that the accumulation can be applied to the ceter pixels from which the OB data can be detected on the light-blocking section 101.

The values Nh and Nv discussed above are preferably 2^n because division in digital processing can be performed by rounding-down of 2^n. The average value of OB data on pixels in the light-blocking section 101 ($16 \leqq$ pixels $\leqq 32$, for example) is obtained by accumulation on 16 pixels and rounding-down of

the lower 4 bits of the accumulated data. The average value for pixels equal to 32 or more can be obtained by accumulation for the 32 pixels and 5-bit shifting of the accumulated data.

The digital video signal and the OB data obtained as above are supplied to a digital processor for obtaining the difference between the digital signal and data and performing digital clamping processing to cancel the difference. In other words, the reference (black) level of the digital video signal is adjusted on the basis of the OB data.

One type of video cameras that has recently been on the market is capable of high-speed photographing in which signals are read from the CCD several times for one field period (VD) for photographing several pictures within one field period.

Such a high-speed photographing mode further accumulates the horizontal OB data obtained as discussed above in the vertical direction to calculate average OB data for further accurate black level adjustments for pictures.

However, the digital clamping processing discussed above cannot be applied to such a high-speed photographing-type of video cameras for several reasons.

Digital clamping processing for video data of "n" pictures within one field period (VD), for which signals are read from CCD several times for one VD from the present vertical synchronizing signal to the succeeding synchronizing signal, would generate noises on the period of OB data to one video data per one VD, which overlaps the period of "n" video data per one VD.

Moreover, the larger the number "n", the shorter the period of digital clamping processing for video data of "n" pictures per one VD. High-speed CPUs are thus required for such high-speed digital clamping processing.

High-speed CPUs, however, consume a lot of power to generate heat; and hence require cooling mechanism, thus causing difficulty in compactness of camera size, shortage of battery life-time, and cost-up in fabrication.

SUMMARY OF THE INVENTION

A purpose of the present invention is to provide an image pickup apparatus and a method of controlling the image pickup apparatus that offer accurate digital clamping processing for, for example, high-speed photographing, without high-speed CPUs.

The present invention provides an image pickup apparatus. The apparatus has an image pickup device having a light-receiving section to receive light from an object to generate an analog video signal, and a light-blocking section to block the light to generate reference signals. The apparatus also has an analog-to-digital converter to convert the analog video signal into a digital video signal; a processor to accumulate the reference signals a predetermined number of times from a predetermined accumulation starting point on scanning lines forming an image of the object for a specific period and average the accumulated signal to generate an average signal; and an adjuster to adjust a reference level of the digital video signal based on the average signal so that the difference between the digital video signal and the average signal becomes zero.

Furthermore, the present invention provides a method of controlling an image apparatus having a light-receiving section and a light-blocking section. Light is received from an object by the light-receiving section to generate an analog video signal. The light is blocked by the light-blocking section to generate reference signals. The analog video signal is converted into a digital video signal. The reference signals are accumulated a predetermined number of times from a predetermined accumulation starting point on scanning lines forming an image of the object for a specific period. The accumulated signal is averaged to generate an average signal. A reference level of the digital video signal is adjusted based on the average signal so that the difference between the digital video signal and the average signal becomes zero.

Moreover, the present invention provides a method of controlling an image apparatus having a light-receiving section and a light-blocking section. Light is received from an object by the light-receiving section to generate a plurality of analog video signals for a first field period. The light is blocked by

the light-blocking section to generate reference signals for each analog video signal. The analog video signals are converted into digital video signals. The reference signals are accumulated for each digital video signal to generate a first accumulated signal. The first accumulated signal is averaged to generate a first average signal. The first average signal is accumulated for all the video signals for a second field that follows the first field period to generate a second accumulated signal. The second accumulated signal is averaged to generate a second average signal. A reference level of each digital video signal is adjusted based on the second average signal so that the difference between the digital video signals and the second average signal becomes zero.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1A illustrates CCD arrangements for video cameras;

FIG. 1B explains optical black data calculation;

FIG. 2 shows a block diagram of a preferred embodiment of an image pickup apparatus according to the present invention;

FIG. 3 is a timing chart explaining an embodiment of digital clamping processing according to the present invention;

FIG. 4 is a timing chart explaining another embodiment of digital clamping processing according to the present invention; and

FIG. 5 illustrates still another embodiment of digital clamping processing according to the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Preferred embodiments according to the present invention will be disclosed with reference to the attached drawings.

FIG. 2 shows a block diagram of a preferred embodiment of an image pickup apparatus according to the present invention.

A charge-coupled device (CCD) 1 driven by a driver (TG) 5 picks up images of an object to generate an image signal. The image signal is supplied to a correlation double-sampling/automatic gain control (CDS/AGC) section 2 for noise-rejection by correlation double-sampling and amplifying the noise-rejected signal with a predetermined gain, to output

an analog video signal. The analog video signal is converted into a digital video signal by an analog-to-digital converter (AD) 3.

The digital video signal is supplied to a digital processor (DSP) 4 for signal processing which will be described later in detail.

Optical black (OB) data obtained by the DSP 4 is supplied to a controller 9. The OB data is processed by a CPU 91 within a predetermined range and supplied to a digital-to-analog (DA) converter 92. The DA converter 92 generates an analog signal that is supplied to the CDS/AGC 2 for offset voltage adjustments. The CDS/AGC 2 performs calculation on OB data supplied by the CCD 1 under the adjusted offset voltage.

The offset voltage adjustments are repeatedly performed by the loop of the CDS/AGC 2, AD3 and DSP 4 to adjust OB data to be supplied to the DSP 4 within a predetermined range.

The digital video signal that has been supplied to the DSP 4 is supplied to a horizontal OB data accumulation/averaging (HOB-ACC/AVE) section 410 and also a calculator 420.

The HOB-ACC/AVE 410 accumulates OB data in the horizontal direction and averaging the accumulated data according to calculation information supplied by the CPU 91. In other words, the HOB-ACC/AVE 410 accumulates the OB data in the horizontal direction and averaging the accumulated data while the OB data are read from the CCD 1.

This processing is explained in detail with reference to FIG. 3.

FIG. 3 illustrates four (n = 4) video data within one field period (VD) from the present to the succeeding vertical synchronizing signals.

The CPU 91 supplies data of accumulation starting point and the number of scanning lines (times of) for accumulation to the HOB-ACC/AVE 410 via a digital counter 470 to calculate an average OB data in the horizontal direction. The digital counter 470 will be explained later in detail.

The average OB data is supplied to a vertical OB data accumulation/averaging (VOB-ACC/AVE) section 430. The VOB-

ACC/AVE 430 accumulates the average OB data in the vertical direction and calculates an average OB data in the vertical direction according to data of accumulation starting point and the number of lines for accumulation supplied by the CPU 91. The average OB data in the vertical direction is supplied to a memory 450.

The accumulation starting point and the number of scanning lines for accumulation are decided according to the performance specifications of the TG 5, as already described.

Suppose that OB data appears after 22 lines from the rising edge of a vertical synchronizing signal and disappears after 68 lines under the control of the TG 5.

One picture consists of 46 lines (= 68 - 22); and hence the number of lines for accumulation is 32 according to the following table:

NLV	2	4	8	16	32	64	128
AS	1	2	3	4	5	6	7

where NLV is the number of lines to be added in the vertical direction, and AS is the amount of shifting (which will be explained later).

The accumulation starting point is decided as follows:

(46 - 32)/2 = 7 (so that the range of accumulation comes to the center of picture);

then, the starting point is 22 + 7 = 29.

The OB data stored in the memory 450 is supplied to the calculator 420 at the succeeding vertical synchronizing signal (VD) and subtracted from the digital video signal supplied by the AD 3. An output signal of the calculator 420 is processed by a signal processor 460 and output from the image pickup apparatus.

The processing is performed so that the output signal indicating the difference between the OB data and digital video signal becomes zero as much as possible. Accordingly, the reference (black) level of the digital video signal is set according to the OB data.

New OB data is obtained for the further succeeding vertical synchronizing signal and stored in the memory 450 in place of

the former OB data for updating.

The DSP 4 performs digital clamping processing to set the reference level of the video signal output from the CCD 1 according to the OB data (black reference signal).

The digital clamping processing is performed as follows:

Horizontal OB data included in the digital video signal supplied by the AD 3 is processed by the HOB- and VOB-ACC/AVEs 410 and 430 to obtain the average OB data. The difference between the digital video signal and the average OB data is obtained by the calculator 420. The average OB data supplied to the calculator 420 from the memory 450 is adjusted so that the difference becomes zero as much as possible.

The average OB data obtained by the DSP 4 is supplied to the CPU 91 and processed so that it is within a predetermined range. The processed data is supplied to the DA 92 for analog signal generation. The analog signal is supplied to the CDS/AGC 2 for offset voltage adjustments. The CDS/AGC 2 processes the succeeding OB data supplied by the CCD 1 according to the adjusted offset voltage. The offset voltage adjustments are repeatedly performed by the loop of the CDS/AGC 2, AD 3, DSP 4 and controller 9 so that OB data supplied to the DSP 4 is adjusted within a predetermined range.

The accumulation starting point setting for the HOB- and VOB-ACC/AVEs 410 and 430 via the digital counter 470 is disclosed in detail.

The digital counter 470 is reset at the rising edge of each vertical synchronizing signal to start counting. The count value is used for accumulation starting point setting. Another digital counter that is reset at the falling edge of each vertical synchronizing signal, for example, can also be used.

As explained with reference to the table shown above, setting the number of lines for OB data accumulation as 2^n allows average OB data calculation by bit-shifting designated by the CPU 91.

The number "128" is the maximum number of lines because the value that comes next to 128 (= 2^7) is 256(= 2^8) is larger than the number of scanning lines for TV signals according to

the NTSC system, as already explained.

The average OB data calculation is performed by bit-shifting with 2^n because the amount of shifting "1" means division with a divisor 2 (= 2^1), and the amount of shifting "2" means division with a divisor 4 (= 2^2) in the shown in above. In other words, the amount of shifting "n" in the table means division with a divisor 2^n.

When several video data exist within one VD as shown in FIG. 3, the amount of shifting is decided according to the number of lines for the several video data. For example, when the number of lines for the several video data is 80, the number of lines to be added in the vertical direction (NLV) is 64 and the amount of shifting (AS) is 6; furthermore, when the number of lines for the several video data is 63, the NLV is 32 and the AS is 5, according to the table shown in above.

As disclosed, designation of the accumulation starting point and the number of lines for accumulation by the CPU 91 provides accurate digital clamping data for a digital video signal carrying a plurality of video data within one VD.

Moreover, designation of the accumulation starting point and the number of lines for accumulation by the CPU 91 provides accurate digital clamping data for a digital video signal that carries one video data within one VD, and is in synchronism with the vertical synchronizing signal.

Disclosed next with reference to FIG. 4 is that the digital counter 470 is reset at the rising edge of vertical synchronizing signals that appear four times (n = 4) within one VD. Compared to FIG. 3, the digital counter 470 is reset for each digital video signal. Accordingly, the digital counter 470 is reset "n" times for one VD.

FIG. 4 illustrates the processing at n = 4; and hence OB data is obtained four times in total for the periods A, B, C and D. The OB data obtained over the periods are accumulated and averaged for obtaining average OB data.

The average OB data is stored in the memory 450 and controlled according to the difference between the average OB data and the digital video signal that appears for the succeeding

one VD for digital clamping processing.

In detail, all the OB data that appear for one VD are accumulated and averaged for obtaining the first average data in the horizontal direction. The average data is further accumulated and averaged for obtaining the second average data in the vertical direction. The second average data is used for setting the reference (black) level of a digital video signal that appears for another VD that follows the VD for which the second average data has been obtained, for providing an accurate count value to the digital counter 470 to achieve further accurate digital clamping processing.

FIG. 4 illustrates accumulation and averaging of OB data for the periods A, B, C and D. However, not only this, but also, another processing, such as, accumulation and averaging of OB data for portions of the periods A and B, A and C, and A and D; A and D; A, B and C; B and C; B and D; B, C and D; C and D, can be applied to digital clamping processing for reference (black) level setting for digital video signals.

Moreover, for digital clamping processing for a digital video signal carrying "n" number of video data for one VD that have been read "n" times from the CCD 1 by high-speed photographing, designation of accumulation starting point and the number of lines for accumulation by the CPU 91 offers accurate digital clamping processing. Setting the number of lines for accumulation to 2^n offers bit-shifting for OB data averaging, thus achieving simple processing.

Disclosed next with reference to FIG. 5 is that video signals appear twice for one HD and VD, compared to four times (n = 4) for one VD in FIG. 4.

In FIG. 5, OB data for each of the portions "a", "b", "c" and "d" are accumulated and averaged in the horizontal direction and also in the vertical direction. The average values thus obtained are further accumulated and averaged to obtain average OB data. The average OB data is stored in the memory 450 and controlled according to the difference between the average OB data and digital video signal that appears for the succeeding VD.

FIG. 5 illustrates accumulation and averaging of OB data for the portions "a", "b", "c" and "d". However, not only this, but also, another processing, such as, accumulation and averaging of OB data for locations of the locations "a" and "b", "a" and "c"; and "a" and "d"; "a", "b and "c"; "b" and "c"; "b" and "d"; "b", "c" and "d"; and "c" and "d", can be applied to digital clamping processing for reference (black) level setting for digital video signals.

Moreover, for digital clamping processing for a digital video signal carrying "n" x "m" number of video data that have been read "n" times from the CCD 1 for one HD and read "m" times from the CCD 1 for one VD by high-speed photographing, designation of accumulation starting point and the number of lines for accumulation by the CPU 91 offers accurate digital clamping processing. Setting the number of line for accumulation to 2^n offers bit-shifting for OB data averaging, thus acheiving simple processing.

As disclosed above, the present invention offers a single digital clamping circuit for digital clamping of digital video signal carrying a plurality of video data for each field period with no special component for high-speed processing, such as high-speed CPU, thus achieving less generation of heat, less power consumption and less cost-up.

WHAT IS CLAIMED IS:

1. An image pickup apparatus comprising:

an image pickup device having a light-receiving section to receive light from an object to generate an analog video signal, and a light-blocking section to block the light to generate reference signals;

an analog-to-digital converter to convert the analog video signal into a digital video signal;

a processor to accumulate the reference signals a predetermined number of times from a predetermined accumulation starting point on scanning lines forming an image of the object for a specific period and average the accumulated signal to generate an average signal; and

an adjuster to adjust a reference level of the digital video signal based on the average signal so that the difference between the digital video signal and the average signal becomes zero.

2. The image pickup apparatus according to claim 1 further comprising a controller to decide the number of times for accumulation as 2^n that is smaller than a specific number "m" of the scanning lines for forming the image of the object, "n" and "m" being positive integers, and to decide the accumulation starting point as $(m - 2^n)/2$.

3. A method of controlling an image apparatus having a light-receiving section and a light-blocking section comprising the steps of:

receiving light from an object by the light-receiving section to generate an analog video signal;

blocking the light by the light-blocking section to generate reference signals;

converting the analog video signal into a digital video signal;

accumulating the reference signals a predetermined number of times from a predetermined accumulation starting point on scanning lines forming an image of the object for a specific

period;

averaging the accumulated signal to generate an average signal; and

adjusting a reference level of the digital video signal based on the average signal so that the difference between the digital video signal and the average signal becomes zero.

4. The controlling method according to claim 3 further comprising the steps of:

deciding the number of times for accumulation as 2^n that is smaller than a specific number "m" of the scanning lines for forming the image of the object, "n" and "m" being positive integers; and

deciding the accumulation starting point as $(m - 2^n)/2$.

5. A method of controlling an image apparatus having a light-receiving section and a light-blocking section comprising the steps of:

receiving light from an object by the light-receiving section to generate a plurality of analog video signals for a first field period;

blocking the light by the light-blocking section to generate reference signals for each analog video signal;

converting the analog video signals into digital video signals;

accumulating the reference signals for each digital video signal to generate a first accumulated signal;

averaging the first accumulated signal to generate a first average signal;

accumulating the first average signal for all the video signals for a second field that follows the first field period to generate a second accumulated signal;

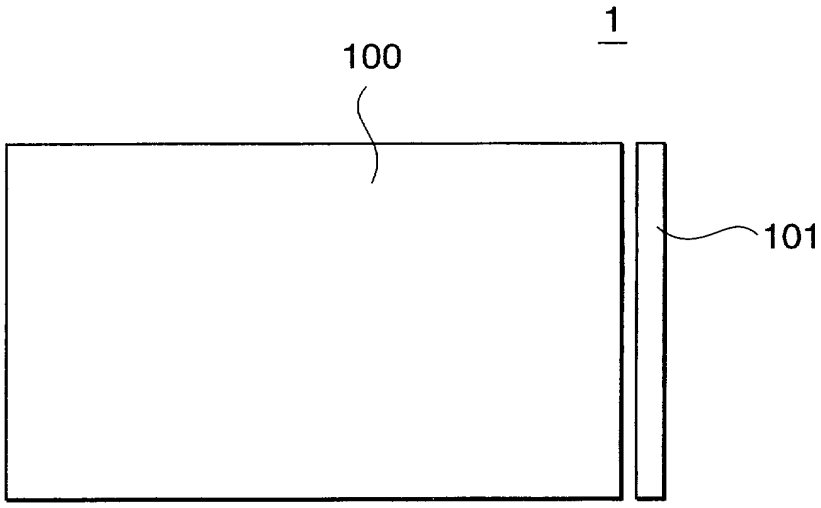
averaging the second accumulated signal to generate a second average signal; and

adjusting a reference level of each digital video signal based on the second average signal so that the difference between the digital video signals and the second average signal becomes

zero.

ABSTRACT OF THE DISCLOSURE

An image apparatus has a light-receiving section and a light-blocking section. The light-receiving section receives light from an object to generate an analog video signal. The light-blocking section blocks the light to generate reference signals. The analog video signal is converted into a digital video signal. The reference signals are accumulated a predetermined number of times from a predetermined accumulation starting point on scanning lines forming an image of the object for a specific period. The accumulated signal is averaged to generate an average signal. A reference level of the digital video signal is adjusted based on the average signal so that the difference between the digital video signal and the average signal becomes zero. The number of times for accumulation is decided as 2^n that is smaller than a specific number "m" of the scanning lines for forming the image of the object. The accumulation starting point is decided as $(m - 2^n)/2$, "n" and "m" being positive integers.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100
101

FIG.1A

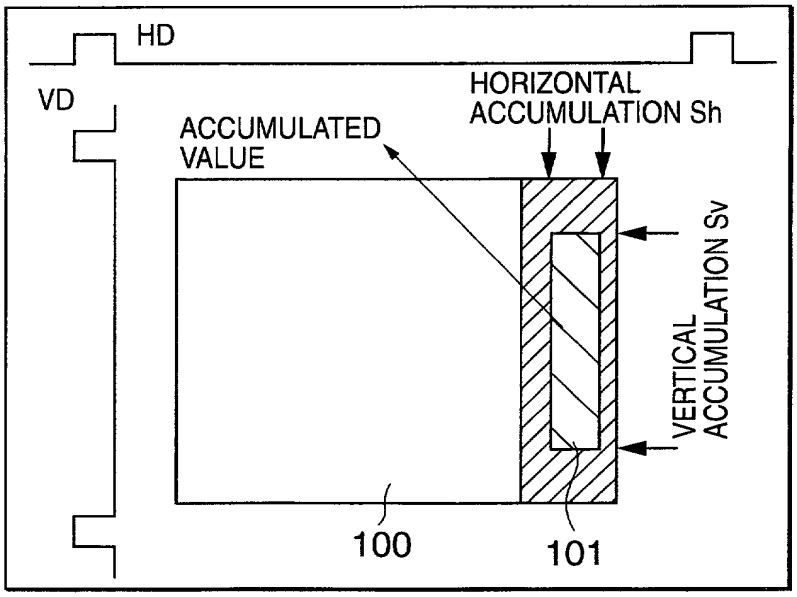
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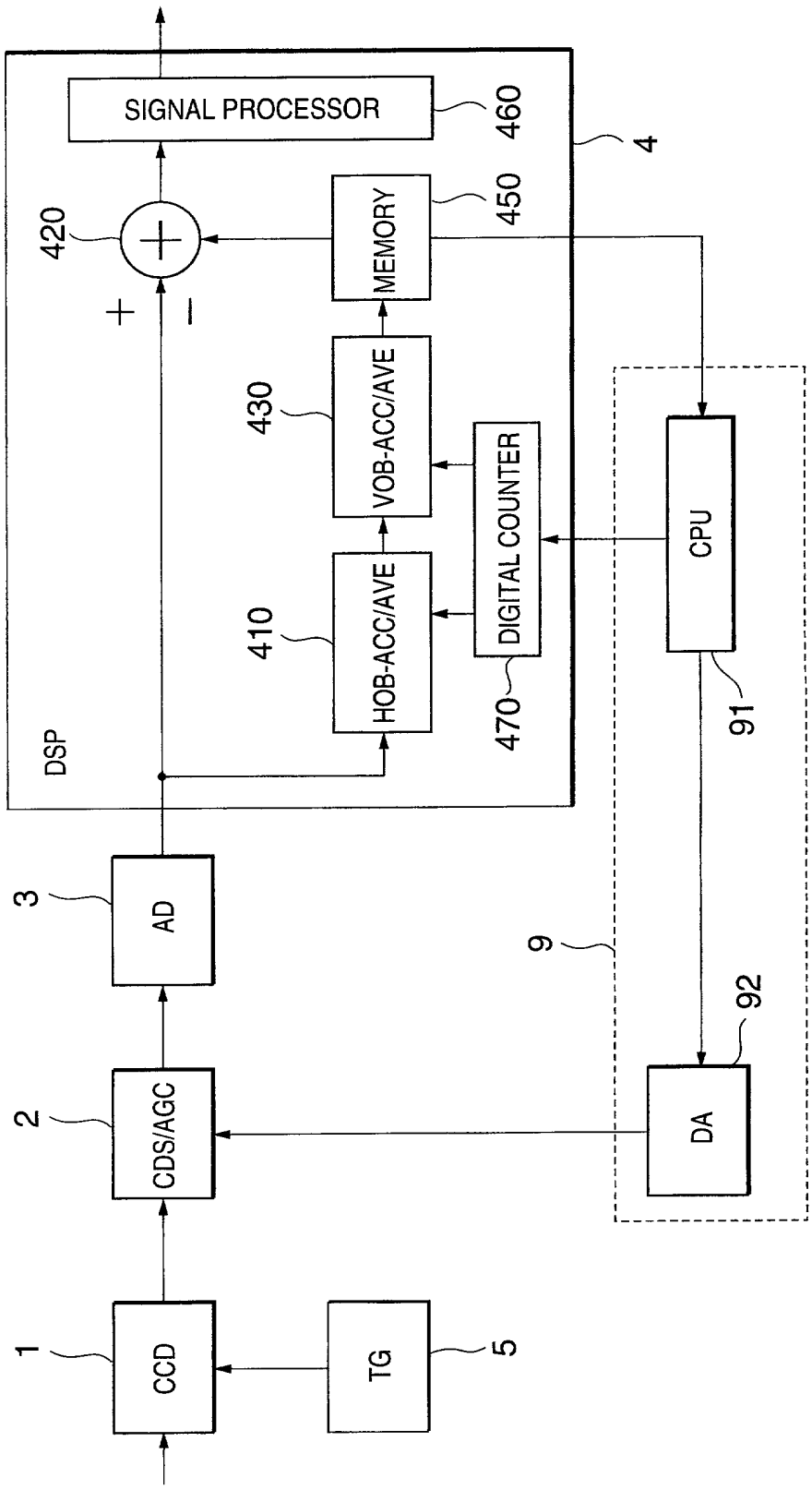
FIG.1B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MEMORY
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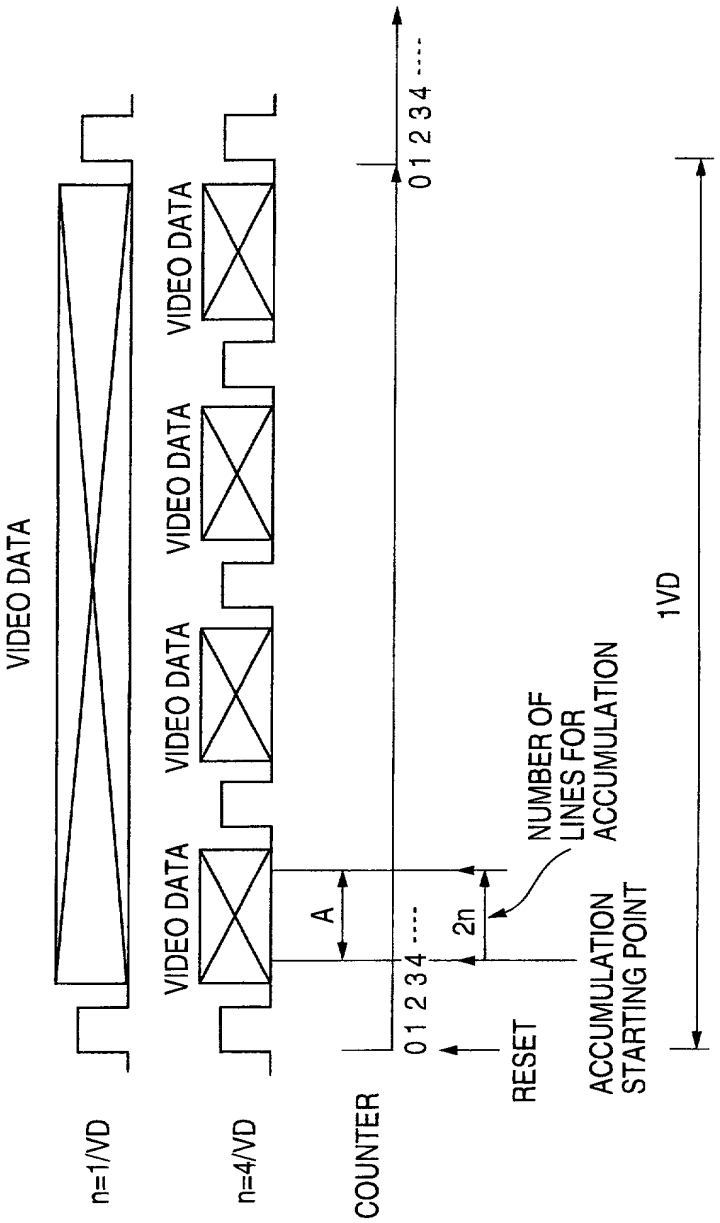
FIG.2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VIDEO DATA
VIDEO DATA
VIDEO DATA
VIDEO DATA
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n=4/VD
COUNTER
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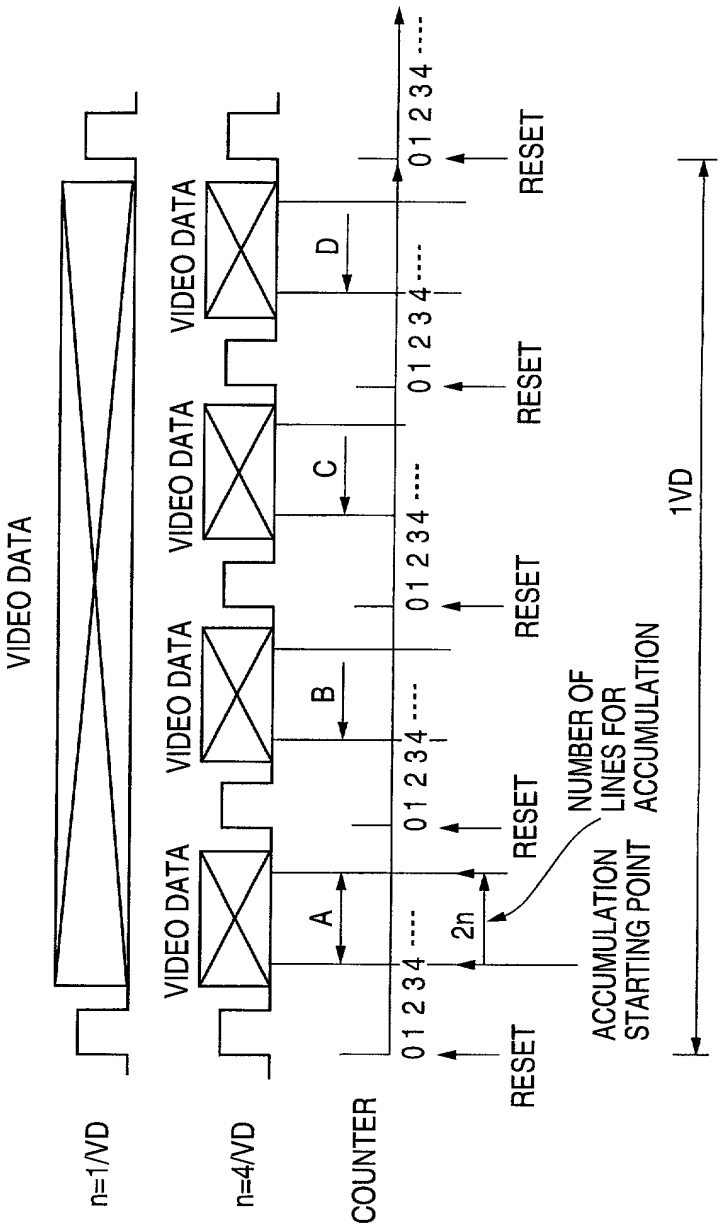
0 1 2 3 4 ----
A
2n
RESET
NUMBER OF LINES FOR ACCUMULATION
ACCUMULATION STARTING POINT
1VD

FIG. 3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VIDEO DATA
n=4/VD
A
B
C
D
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COUNTER
0 1 2 3 4 ----
RESET
ACCUMULATION STARTING POINT
NUMBER OF LINES FOR ACCUMULATION
1VD

FIG.4

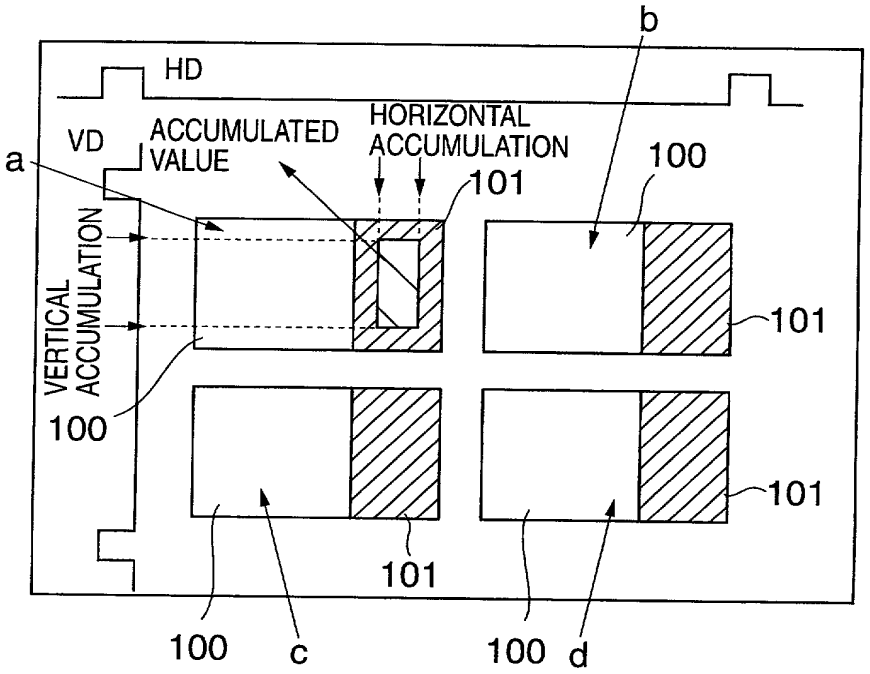
HD
VD
ACCUMULATED VALUE
HORIZONTAL ACCUMULATION
VERTICAL ACCUMULATION
a
b
c
d
100
101

FIG.5

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Attorney's Ref. No.: _____

Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は、下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

IMAGE PICKUP APPARATUS AND METHOD OF CONTROLLING THE SAME

上記発明の明細書（下記の欄で×印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ _____に提出され、米国出願番号または
特許協定条約 国際出願番号を _____ とし、
（該当する場合） _____ に訂正されました。

☐ was filed on
as United States Application Number or
PCT International Application Number

and was amended on
_____ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第３７編第１条５６項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

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私は、米国法典第３５編１１９条（ａ）-（ｄ)項又は３６５条(ｂ)項に基き下記の、米国以外の国の少なくとも１ヶ国を指定している特許協力条約３６５条(ａ)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s) 外国での先行出願			Priority Not Claimed 優先権主張なし
1999-236627	Japan	24/August/1999	☐
(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	
			☐
(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	

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(Application No.) (出願番号)	(Filing Date) (出願日)	(Application No.) (出願番号)	(Filing Date) (出願日)

私は下記の米国法典第３５編１２０条に基いて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約３６５条(ｃ)に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第３５編１１２条第１項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第３７編１条５６項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

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(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況：特許許可済、係属中、放棄済)
(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況：特許許可済、係属中、放棄済)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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委任状： 私は、下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。(弁護士、または代理人の氏名及び登録番号を明記のこと)

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国籍 日本	Citizenship
私書箱	Post Office Address
(第三以降の共同発明者についても同様に記載し、署名をすること)	(Supply similar information and signature for third and subsequent joint inventors.)